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STATE OF NORTH BORNEO

Annual Report

on the

MEDICAL DEPARTMENT

for 1938

by

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STATE OF NORTH BORNEO

ANNUAL REPORT
ON THE
MEDICAL DEPARTMENT FOR THE YEAR 1938

I.—VITAL STATISTICS

Population.—The estimated population of North Borneo on the 31st December, 1937, was 299,311. The number of live births registered during the year was 7,819 and the number of deaths 8,567. The excess of immigration over emigration during the year amounted to 3,611. The estimated population of the State on 31st December, 1938 was therefore 302,174, an increase of 2,863 on the figure for 1937.

2. The relevant vital data for 1938 are as follows:—

Race	Estimated Population	Births	Birth Rate <i>per mille</i>	Deaths	Death Rate <i>per mille</i>	Infant Deaths	Infant morta- lity <i>per mille</i>
Europeans ...	393	6	15.2	4	10.2	1	167
Natives of North Borneo ...	229,471	5,786	25.2	7,000	30.5	1,149	202
Chinese ...	53,636	1,904	35.5	1,274	23.7	326	175
Malays ...	12,933	160	12.4	230	17.7	40	286
Others ...	5,741	123	21.4	59	10.3	17	147
Totals ...	302,174	7,979	26.4	8,567	28.3	1,533	196

3. Sex ratio of males to females.

	Births	Deaths
Europeans ...	50 : 100	300 : 100
Natives of North Borneo ...	110 : 100	123 : 100
Chinese ...	130 : 100	242 : 100
Malays and Javanese ...	125 : 100	297 : 100
Others ...	89 : 100	247 : 100

4. 1,533 deaths or 17.9% of the total mortality occurred during the first year of life, compared with 1,286 deaths and 17% in 1937. The infantile mortality calculated on the number of live births recorded during the year was 196.1 *per mille* compared with 163.3 *per mille* in 1937 and 176.5 *per mille* in 1936.

Summary of Infantile Mortality according to Races for the year 1938.

Race	Live Births	Infant Deaths	Mortality <i>per mille</i> .
Europeans ...	6	1	167
Natives of the State ...	5,698	1,149	202
Chinese ...	1,859	326	170
Malays and Javanese ...	140	40	286
Others ...	116	17	147
Total ...	7,819	1,533	196

The following table gives for comparison the Infant Mortality in the Federated Malay States for 1934:—

Malays	...	181 <i>per mille</i>
Chinese	...	151 <i>per mille</i>
Others	...	81 <i>per mille</i> .

5.

Classification of Births in North Borneo, 1938.

District.	Total.	Europeans		Natives		Chinese		Malays		Others	
		Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Bundu Tuhan	...	196	—	99	97	—	—	—	—	—	—
Ranau	...	242	—	137	103	2	—	—	—	—	—
Tambunan	...	397	—	222	172	3	—	—	—	—	—
Keningau	...	184	—	85	81	9	7	—	2	—	—
Sepulot	...	29	—	18	11	—	—	—	—	—	—
Pensiangan	...	164	—	89	75	—	—	—	—	—	—
Tenom	...	204	—	56	72	40	31	5	—	—	—
Sipitang	...	200	—	94	87	8	8	2	1	—	—
Mempakul	...	316	—	152	151	6	7	—	—	—	—
Beaufort	...	407	—	128	136	72	39	15	7	4	6
Papar	...	696	—	270	246	75	69	11	7	10	8
Penampang	...	290	—	137	115	20	7	7	4	—	—
Jesselton	...	307	1	26	33	135	88	7	2	8	6
Menggatal	...	117	—	49	42	9	14	1	2	—	—
Tuaran	...	473	—	221	197	26	21	1	1	3	3
Kota Belud	...	592	—	292	274	15	9	—	1	1	—
Kudat	...	707	—	262	267	98	77	1	1	—	1
Labuk and Sugut	...	472	—	239	215	6	7	2	1	1	1
Kinabatangan	...	244	—	134	101	3	1	3	2	—	—
Sandakan	...	832	1	61	48	374	301	13	9	10	13
Tambisan	...	56	—	27	27	1	1	—	—	—	—
Tungku	...	59	—	29	27	1	2	—	—	—	—
Lahad Datu	...	117	—	38	24	20	13	6	8	5	2
Semporna	...	217	—	101	94	12	8	—	—	—	2
Tawau	...	461	—	68	57	143	116	15	23	16	23
Total	...	7,979	2	3,034	2,752	1,078	826	89	71	58	65

6.

Classification of deaths from all causes at different ages.

AGE GROUP										
District.	Total.	Under 1 year.	1—4 years.	5—9 years.	10—19 years.	20—29 years.	30—39 years.	40—49 years.	50 years and over.	
Tawau	400	106	30	4	19	41	67	63	70	
Semporna	182	48	12	5	15	30	26	25	21	
Lahad Datu	234	36	11	4	14	20	40	38	71	
Tungku	69	8	6	3	4	8	16	12	12	
Tambisan	23	13	—	3	1	—	1	2	3	
Kinabatangan	219	57	29	2	16	16	19	43	37	
Sandakan	643	172	60	14	12	73	78	77	157	
Labuk and Sugut	400	109	61	18	26	34	45	47	60	
Kudat	656	168	85	31	38	38	102	79	115	
Kota Belud	663	109	61	40	62	92	81	62	156	
Tuaran	458	54	80	24	30	45	60	54	111	
Menggatal	130	19	21	10	8	11	18	19	24	
Jesselton	277	72	32	11	7	10	33	41	71	
Penampang	316	30	67	40	32	29	27	34	57	
Papar	608	112	63	33	43	59	74	73	149	
Beaufort	427	125	51	24	26	32	42	31	96	
Mempakul	308	89	50	14	15	18	33	31	58	
Sipitang	120	29	10	5	7	14	15	8	32	
Tenom	338	22	37	17	32	23	71	59	77	
Pensiangan	222	8	2	4	17	27	68	34	62	
Sepulot	120	5	1	—	10	27	29	20	28	
Keningau	714	36	41	16	43	120	194	139	125	
Tambunan	567	45	73	22	56	69	120	57	125	
Ranau	333	43	38	11	15	43	77	50	56	
Bundu Tuhan	140	18	15	3	5	10	9	24	56	
Total	8,567	1,533	936	358	555	839	1,345	1,122	1,829	

7. Classification of deaths in the five Civil Hospitals by Race and Cause.

Disease.	Total No. of deaths	Europeans		Natives		Chinese		Malays		Others	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Typhoid fever ...	2	—	—	1	—	1	—	—	—	—	—
Diphtheria ...	3	—	—	—	—	1	2	—	—	—	—
Dysentery, amœbic ...	36	—	—	7	4	19	6	—	—	—	—
Cerebrospinal fever ...	1	1	—	—	—	—	—	—	—	—	—
Tuberculosis of the respiratory system ...	19	—	—	3	1	12	2	—	—	1	—
Other tuberculous diseases ...	1	—	—	—	—	1	—	—	—	—	—
Venereal diseases, Syphilis ...	1	—	—	—	—	1	—	—	—	—	—
MALARIA—											
(a) Benign tertian ...	9	—	—	—	—	5	4	—	—	—	—
(b) Subtertian ...	10	2	—	1	—	4	2	—	—	—	1
(c) Quartan ...	1	—	—	—	—	1	—	—	—	—	—
(d) Unclassified ...	17	—	—	5	1	9	2	—	—	—	—
Blackwater fever ...	3	—	—	—	—	3	—	—	—	—	—
Yaws ...	1	—	—	—	1	—	—	—	—	—	—
CANCER AND OTHER TUMOURS—											
(a) Malignant ...	6	—	—	—	1	2	3	—	—	—	—
(b) Non-malignant ...	2	—	—	—	—	1	1	—	—	—	—
(c) Undetermined ...	1	—	—	—	—	—	—	1	—	—	—
Beri-beri ...	34	—	—	8	2	20	4	—	—	—	—
OTHER DISEASES—											
(a) Nutritional ...	2	—	—	—	—	2	—	—	—	—	—
(b) Endocrine glands and general ...	1	—	—	—	—	—	1	—	—	—	—
Cerebral hæmorrhage ...	2	—	—	—	—	—	2	—	—	—	—
Other diseases of the nervous system ...	5	—	—	—	—	4	—	—	—	—	1
Diseases of the circulatory system, Heart diseases ...	7	—	—	—	—	7	—	—	—	—	—
Bronchitis ...	5	—	—	—	—	5	—	—	—	—	—
PNEUMONIA—											
(a) Broncho-pneumonia ...	29	—	—	1	2	17	5	1	—	3	—
(b) Lobar-Pneumonia ...	42	—	—	7	1	28	4	—	—	1	1
Other diseases of the respiratory system ...	1	—	—	—	1	—	—	—	—	—	—
Diarrhœa and enteritis—Under 2 years of age ...	5	—	1	—	1	1	2	—	—	—	—
Appendicitis ...	1	—	—	—	—	1	—	—	—	—	—
Hernia, intestinal obstruction ...	1	—	—	—	—	1	—	—	—	—	—
Cirrhosis of the liver ...	9	—	—	—	—	8	1	—	—	—	—
Other diseases of the liver and biliary passages ...	2	—	—	1	—	1	—	—	—	—	—
Other diseases of the digestive system ...	16	—	—	1	1	9	3	—	—	2	—
NEPHRITIS (ALL FORMS)											
(a) Acute ...	10	—	—	—	—	4	5	—	—	1	—
(b) Chronic ...	5	—	—	1	1	2	—	1	—	—	—
Other non-venereal diseases of genito-urinary system ...	2	—	—	—	1	1	—	—	—	—	—
DISEASES OF PREGNANCY CHILD-BIRTH, AND THE PUERPERAL STATE—											
(a) Toxæmias of Pregnancy ...	2	—	—	—	2	—	—	—	—	—	—
(b) Other conditions of the puerperal state ...	1	—	—	—	—	—	1	—	—	—	—
Diseases of the skin, cellular tissue bones and organs of locomotion ...	14	—	—	—	1	9	1	—	—	1	2
Congenital malformations and diseases of early infancy—Congenital debility (children under 1 year) ...	5	—	—	—	—	2	3	—	—	—	—
Senility ...	3	—	—	—	—	2	1	—	—	—	—
External causes—By violence ...	9	—	—	1	2	4	—	—	—	2	—
Ill-defined causes ...	2	—	—	—	—	1	1	—	—	—	—
Total deaths all causes	328	3	1	37	23	189	56	3	—	11	5

II.—GOVERNMENT MEDICAL INSTITUTIONS

8. On 1st January, 1938, there remained 420 patients under treatment in eighteen Government Medical Institutions. During the year 6,287 patients were admitted giving a total under treatment of 6,707 compared with 5,895 in 1937 and 4,250 in 1936. Of the 6,707 patients treated 5,591 were discharged cured, 242 were transferred, 22 absconded, 442 died and 410 patients remained under treatment on 31st December, 1938.

The mean death rate for all hospitals was 6.6 *per cent.* compared with 5.8 *per cent.* in 1937.

EUROPEAN AND SECOND CLASS WARDS

9. SANDAKAN CIVIL HOSPITAL.—During the year twelve patients were admitted to the European Wards with two deaths compared with twenty-seven patients and no death in 1937.

127 patients were admitted to the Second Class Wards with 6 deaths compared with 120 admissions and 5 deaths in 1937.

10. JESSELTON CIVIL HOSPITAL.—44 patients were treated in the European Wards with one death, compared with 22 patients and no deaths in 1937.

In the Second Class Wards, there were 157 admissions with 8 deaths, compared with 109 admissions and 3 deaths during 1937.

11. The following summary shows the number of in-patients treated in each hospital during the year, 1938:—

IN-PATIENTS TREATED IN GOVERNMENT MEDICAL INSTITUTIONS
DURING THE YEAR 1938

Institution	Remained 1.1.38	Admitted	Total	Discharged	Trans- ferred	Absconded	Died	Remained 31.12.38	Death Rate per cent.
Sandakan Civil Hospital	56	1,574	1,630	1,369	70	—	140	51	8.6
Sandakan Gaol Hospital	6	43	49	33	9	—	5	2	10.2
Jesselton Civil Hospital	33	1,138	1,171	1,015	38	4	83	31	7.1
Jesselton Constabulary Hospital	8	210	218	196	20	—	—	2	—
Jesselton Gaol Hospital	11	128	139	88	34	—	11	6	7.9
Beaufort Civil Hospital	25	341	366	299	24	1	22	20	6.0
Kudat Civil Hospital	20	895	915	828	7	9	37	34	4.0
Tawau Civil Hospital	20	504	524	440	20	1	46	17	8.8
Kota Belud Sick Rest House	4	105	109	90	5	—	4	10	3.7
Sipitang Sick Rest House	14	175	189	187	—	—	2	—	1.1
Tenom Sick Rest House	8	223	231	201	9	—	15	6	6.5
Pensiangan Sick Rest House	5	256	261	235	—	3	1	22	0.4
Keningau Sick Rest House	16	306	322	277	1	2	25	17	7.8
Tambunan Sick Rest House	12	305	317	293	—	—	17	7	5.4
Ranau Sick Rest House	4	44	48	36	—	2	4	6	8.3
Mental Hospital, Sandakan	109	32	141	2	5	—	25	109	17.7
Leper Colony, Sandakan	69	8	77	2	—	—	5	70	6.5
Total	420	6,287	6,707	5,591	242	22	442	410	6.6

III.—GOVERNMENT OUT-PATIENT DEPARTMENTS AND DISPENSARIES

12. Summary of Out-patients treated during 1938.

	New Cases	Repetitions	Total
SANDAKAN:			
Civil Hospital	9,014	21,712	30,726
Constabulary	1,044	709	1,753
Venereal Clinic	163	934	1,097
Gaol Hospital	849	1,756	2,605
JESSELTON:			
Civil Hospital	8,738	2,841	11,579
Constabulary Hospital	3,111	5,484	8,595
Gaol Hospital	808	3,483	4,291
Beaufort Civil Hospital	9,344	1,666	11,010
KUDAT:			
Civil Hospital	5,913	1,214	7,127
Gaol Hospital	907	953	1,860
Tawau Civil Hospital	10,089	7,776	17,865
GOVERNMENT DISPENSARIES:			
Semporna	7,231	4,364	11,595
Klagan	3,482	489	3,971
Kota Belud	17,603	13,825	31,428
Tuaran	5,934	2,516	8,450
Public Works Dept. Dispensary, Tenghilan Road	1,930	3,093	5,023
Papar	19,143	11,788	30,931
Mempakul	8,650	479	9,129
Sipitang	6,467	4,319	10,786
Tenom	5,134	2,727	7,861
Pensiangan	5,542	9,722	15,264
Keningau	14,124	13,319	27,443
Tambunan	14,035	8,624	22,659
Ranau	11,022	11,644	22,666
Bundu Tuhan	13,946	524	14,470
TRAVELLING DISPENSARIES:			
Kudat and Marudu Bay	2,454	—	2,454
Kinabatangan	290	14	304
Total	186,967	135,975	322,942

224,454

186,967

13. The total number of Out-patients treated during the year amounted to 322,942 compared with 282,256 in 1937, an increase of 40,686 patients or 14.4 per cent.

Summary of Out-patients treated during the past five years :—

Year.		Number of patients treated.
1938	...	322,942
1937	...	282,256
1936	...	218,423
1935	...	198,398
1934	...	174,899

14. The figures under Beaufort Civil Hospital in the above summary include patients treated at quarterly clinics held by the District Surgeon at Limbawang, Gadong, Bukau, Weston, Membakut, Kampong Brunei, Kampong Pimping and Kampong Binsulok. Under Tawau the figures include patients attending the clinics at the Chinese settlements at Apas and Sin On and at Kampongs on the Kalabakan and Serudong Rivers also at Sungei Tamang, Morotai Besar, Bengbalai, Apas, Kalumpang and Sindalan. At Tuaran the figures include patients treated at the weekly clinics at Menggattal, Penampang, Putatan and Kinarut.

15. During the year the District Surgeon, Beaufort and Interior, Dr. J. C. T. Tregarthen, made two tours through the Interior. During May and June he visited the Bokaan country, 760 patients were examined and treated at eleven centres, Kindassan, Sungei Atug, Pau, Tulid, Lanas, Linsok, Kuit, Karamatoi, Sook, Bunang and Mapila.

In July and August he visited the Government Dispensaries at Keningau, Tambunan, Ranau and Bundu Tuhan, at which large numbers of patients were examined and treated; in addition, clinics were held at Bingkor, Apin Apin, Purutan, Dangulad, Sensuran, Mangi Pangi, Bebagan, Kerokot, Pahu Pahu, Libang, Mensangoh, Rendagong, Kenipir, Kundasan, Tagudon and Teboh. In all 8,243 natives attended the various clinics and received treatment.

IV.—NEW CONSTRUCTIONS OR ADDITIONS TO EXISTING ACCOMMODATION

16. JESSELTON.—During the latter half of the year work started on the construction of new wards for female patients at Jesselton Civil Hospital; this building on completion will provide the following accommodation :—

General ward with 12 beds for Third Class patients
Maternity ward with 6 beds for Third Class patients
General ward with 4 beds for Second Class patients
Maternity ward with 4 beds for Second Class patients
Labour Room.

In addition a new X-Ray Unit was installed in Jesselton Civil Hospital, giving a rated output of 50 mA at 90 kV.

KENINGAU.—A School of Sanitation was constructed with seven detached houses for pupil sanitary inspectors.

TAMBUNAN.—Work started towards the end of the year on the buildings which will form the Malaria Research Unit at Kampong Timbou, Tambunan.

KLAGAN.—A new dispensary was completed at Klagan and opened on 29th March, 1938.

TONGGOD.—Construction on a new dispensary building at Tonggod commenced, but the building was not completed at the end of the year.

SANDAKAN.—A block of four new isolation rooms for mental patients under observation at the Sandakan Mental Hospital was completed.

V.—PREVAILING DISEASES

MALARIA

17. The following table shows the number of Malaria admissions to, and deaths in, Government Hospitals during the year 1938:—

		Admissions	Deaths
SANDAKAN —			
Civil Hospital	...	425	20
Gaol Hospital	...	1	—
JESSELTON —			
Civil Hospital	...	374	8
Constabulary Hospital	...	27	—
Gaol Hospital	...	5	—
Beaufort Civil Hospital	...	60	1
Kudat Civil Hospital	...	178	2
Tawau Civil Hospital	...	196	5
Kota Belud Sick Rest House	...	9	—
Sipitang Sick Rest House	...	16	1
Tenom Sick Rest House	...	41	—
Pensiangan Sick Rest House	...	18	—
Keningau Sick Rest House	...	18	2
Tambunan Sick Rest House	...	42	1
Ranau Sick Rest House	...	14	—
Total	...	1,424	40

18. *Blackwater Fever*. Jesselton Civil Hospital reported four cases of Blackwater fever with recovery in all cases. Kudat Civil Hospital reported nine cases and one death, Tawau Civil Hospital reported two cases and one death. No cases were reported from Sandakan or Beaufort Civil Hospitals.

19. *Prevailing type of Malaria*. The following table shows the relative frequency of the three species of Malaria parasites seen in positive blood films at Government Hospitals and Dispensaries.

Hospital	Number of film Examined Positive		Subtertian parasites found in	Benign Tertian parasites found in	Quartan parasites found in
Tawau	...	495 135	7.4 per cent.	74.8 per cent.	10.4 per cent.
Sandakan	...	1,021 301	17.6 „	65.8 „	11.6 „
Kudat	...	580 195	64.6 „	21.5 „	10.8 „
Jesselton	...	865 99	10.1 „	73.8 „	13.1 „
Beaufort	...	240 44	38.6 „	25.0 „	18.2 „
Sipitang	...	76 35	60.0 „	31.4 „	5.7 „
Tenom	...	175 25	28.0 „	64.0 „	8.0 „
Pensiangan	...	66 18	83.3 „	16.7 „	— „
Keningau	...	162 36	19.4 „	52.8 „	25.0 „
Tambunan	...	262 46	21.7 „	50.0 „	28.3 „

20. The District Surgeon, Beaufort and Interior, Dr. J. C. T. Tregarthen, examined 760 natives at various centres at the Bokaan country and found the spleen to be enlarged in 659 or 86.7 per cent. In 1937 during a similar tour an enlarged spleen was found in 92.4 per cent. of 1,010 persons examined. The average projection below the costal margin in centimetres was as follows:—

Infants	...	4.4 centimetres
Children under 16	...	4.7 centimetres
Adult males	...	4.3 centimetres
Adult females	...	5.3 centimetres

21. In July, August and September, 1938, Dr. Tregarthen visited the Government Dispensaries between Keningau and Bundu Tuhan, he examined 8,243 natives *en route* and found the spleen enlarged in 6,843 or 83.0 per cent. compared with 93.3 per cent. in 8,626 examined in 1937.

In 3,940 cases the projection of the spleen below the costal margin was measured and the following average projection was found:—

Infants	...	3.7 centimetres
Children under 16	...	4.3 centimetres
Adult males	...	5.2 centimetres
Adult females	...	5.4 centimetres

22. During the year the supplies of efficient mosquito nets to all Government Hospitals and Dispensaries for sale to the general public at cost price were continued. 317 nets were sold, chiefly to natives.

BERI-BERI

23. The following table shows the number of cases of Beri-beri admitted to Government Hospitals during the year 1938, with the number of deaths:—

		Admissions	Deaths
SANDAKAN —			
Civil Hospital	..	227	14
Gaol Hospital	..	1	—
JESSELTON —			
Civil Hospital	..	23	3
Constabulary Hospital	..	1	—
Gaol Hospital	..	—	—
Beaufort Civil Hospital	..	19	1
Kudat Civil Hospital	..	3	1
Tawau Civil Hospital	..	73	15
Sipitang Sick Rest House	..	4	—
Tenom Sick Rest House	..	2	—
Tambunan Sick Rest House	..	3	—
Total	..	356	34

The large increase in the number of cases of beri-beri admitted to hospital was due to a large influx of refugees to the State during the year owing to the hostilities in China.

Summary of cases of Beri-beri treated in Government Hospitals during the past five years:—

Year		Admissions	Deaths
1938	...	356	34
1937	...	185	16
1936	...	164	12
1935	...	131	12
1934	...	185	20

YAWS

24. 6,259 cases of yaws were treated during the year 1938 as follows:—

		New cases	Repetitions	Total
WEST COAST RESIDENCY:				
Bundu Tuhan	...	117	7	124
Ranau	...	239	10	249
Tambunan	...	145	2	147
Keningau	...	310	29	339
Pensiangan	...	49	—	49
Tenom	...	68	6	74
Sipitang	...	138	—	138
Mempakul	...	178	29	207
Beaufort	...	4	—	4
Bangawan	...	51	—	51
Kimanis	...	21	—	21
Kabang	...	41	—	41
Papar	...	540	—	540
Kinarut	...	258	—	258
Jesselton	...	18	—	18
Tuaran	...	336	10	346
Kota Belud	...	680	61	741
EAST COAST RESIDENCY:				
Kudat	...	353	—	353
Marudu Bay	...	1,249	—	1,249
Klagan	...	640	5	645
Sandakan	...	7	—	7
Kinabatangan	...	70	2	72
Semporna	...	473	81	554
Tawau	...	32	—	32
Total	...	6,017	242	6,259

25. The following summary shows the number of cases of yaws treated during the past five years:—

Year		West Coast Residency	East Coast Residency	Total
1938	...	3,347	2,912	6,259
1937	..	4,160	2,224	6,384
1936	...	4,803	2,359	7,162
1935	...	6,052	1,573	7,625
1934	...	5,862	2,013	7,875

DYSENTERY

26. 484 cases of dysentery were admitted to Government hospitals during 1938 with 59 deaths, compared with 466 cases and 22 deaths in 1937.

		Admissions	Deaths
SANDAKAN —			
Civil Hospital	...	30	2
Gaol Hospital	...	9	3
JESSELTON —			
Civil Hospital	...	87	17
Constabulary Hospital	...	4	—
Gaol Hospital	...	26	1
Beaufort Civil Hospital	...	12	2
Kudat Civil Hospital	...	37	9
Tawau Civil Hospital	...	17	5
Tenom Sick Rest House	...	19	2
Pensiangan Sick Rest House	...	13	—
Keningau Sick Rest House	...	80	3
Tambunan Sick Rest House	...	127	11
Ranau Sick Rest House	...	9	3
Sipitang Sick Rest House	...	10	1
Kota Belud Sick Rest House	...	4	—
Total	...	484	59

During the year there were severe outbreaks of amoebic dysentery in the Keningau, Tambunan and Tuaran districts of the West Coast Residency, causing many deaths, there were, however, signs of abatement at the end of the year.

PNEUMONIA

27. 202 cases of lobar pneumonia were admitted to Government hospitals during 1938 with 68 deaths, compared with 170 cases and 84 deaths in 1937.

		Admissions	Deaths
SANDAKAN —			
Civil Hospital	...	12	6
Gaol Hospital	...	—	—
JESSELTON —			
Civil Hospital	...	63	22
Constabulary Hospital	...	10	—
Gaol Hospital	...	—	—
Beaufort Civil Hospital	...	11	3
Kudat Civil Hospital	...	7	3
Tawau Civil Hospital	...	11	5
Tenom Sick Rest House	...	19	9
Pensiangan Sick Rest House	...	21	1
Keningau Sick Rest House	...	37	15
Tambunan Sick Rest House	...	3	2
Ranau Sick Rest House	...	1	1
Sipitang Sick Rest House	...	3	—
Kota Belud Sick Rest House	...	4	1
Total	...	202	68

PULMONARY TUBERCULOSIS

28. 91 cases of pulmonary tuberculosis were admitted to Government hospitals with 23 deaths compared with 95 cases and 23 deaths in 1937.

ANKYLOSTOMIASIS

29. The control of ankylostomiasis initiated in 1921 by the Rockefeller Institute, under the supervision of Dr. Clark H. Yeager, was continued during the year 1938. In Sandakan and Jesselton this work is carried out by a special staff and all Government Servants, school-children and labourers employed on small estates in the vicinity of these towns are examined twice yearly for hookworm infection, and treated if necessary. In Sandakan and Jesselton 8,263 persons were examined of whom 548 were found to be infected with Hookworm disease, the infection rate being 6.6%. In all 13,160 treatments were administered, this figure includes mass treatment, without previous examination, to the inhabitants of Inanam, Mengattal, Telipok, Tuaran, Penampaug, Jesselton, Tanjong Aru, Sembulan, Putatan, Kiuarut and Kawang.

30. The following summary shows the infection rate during the past fifteen years:—

Year	Infection rate <i>per cent.</i>	Year	Infection rate <i>per cent.</i>
1938	6.6	1930	4.7
1937	6.4	1929	5.4
1936	5.7	1928	10.0
1935	4.2	1927	17.0
1934	5.4	1926	18.0
1933	4.9	1925	39.0
1932	5.3	1924	71.0
1931	4.5		

31. In other districts treatments were given by the staff of Government Hospitals and Dispensaries; during the course of Dr. Tregarthen's two tours through the Interior, mass treatment was administered to 5,950 natives.

VI.—SURGICAL OPERATIONS

32. The number of surgical operations performed in Government Hospitals during the year, 1938, amounted to 397, compared with 463 in 1937. The following summary shows the number of operations performed at each hospital:—

	Major	Minor	Total
Sandakan Civil Hospital	10	52	62
Jesselton Civil Hospital	13	123	136
Beaufort Civil Hospital	—	46	46
Kudat Civil Hospital	2	35	37
Tawau Civil Hospital	—	3	3
Tenom Dispensary	2	26	28
Pensiangan Dispensary	—	3	3
Keningau Dispensary	1	22	23
Tambunan Dispensary	—	14	14
Ranau Dispensary	—	—	—
Bundu Tuhan Dispensary	—	8	8
Sipitang Dispensary	—	28	28
Mempakul Dispensary	—	5	5
Kota Belud Dispensary	—	4	4
	28	369	397

In addition to the above 3,255 dental extractions were performed at the various treatment centres in the Interior during the year 1938.

VII.—POSTMORTEM EXAMINATIONS

33. 73 post-mortem examinations were performed during the year in Government hospitals compared with 59 in 1937. The following summary shows the number performed at each hospital:—

Sandakan Civil Hospital	..	47
Jesselton Civil Hospital	..	22
Beaufort Civil Hospital	..	2
Kudat Civil Hospital	..	—
Tawau Civil Hospital	..	—
Keningau Dispensary	..	1
Sipitang Dispensary	..	1
Total	..	73

VIII.—LABORATORY EXAMINATIONS

34. Examination of blood films for Malarial parasites.

		No. of films examined	SPECIES OF PARASITE FOUND				No. of films found negative
			Laverania malariae	Plasmodium vivax	Plasmodium malariae	Mixed infection	
Sandakan Civil Hospital	...	1,021	53	198	35	15	720
Jesselton Civil Hospital	...	865	10	73	13	3	766
Beaufort Civil Hospital	...	240	17	11	8	8	196
Kudat Civil Hospital	...	585	126	42	21	6	390
Tawau Civil Hospital	...	495	10	101	14	10	360
Tenom Dispensary	...	175	7	16	2	—	150
Pensiangan Dispensary	...	66	15	3	—	—	48
Keningau Dispensary	...	162	7	19	9	1	126
Tambunan Dispensary	...	262	10	23	13	—	216
Bundu Tuhan Dispensary	...	16	7	4	2	1	2
Sipitang Dispensary	...	76	21	11	2	1	41
Kota Belud Dispensary	...	25	6	2	—	—	17
Total	...	3,988	289	503	119	45	3,032

35. Prevailing type in films found positive:—

Plasmodium vivax	...	52.6 per cent.
Laverania malariae	...	30.2 „ „
Plasmodium malariae	...	12.5 „ „
Mixed infection	...	4.7 „ „

36. Examination of faeces for intestinal parasites.

The following table shows the various intestinal parasites seen in the films examined:—

	Sandakan Civil Hospital	Jesselton Civil Hospital	Beaufort Civil Hospital	Kudat Civil Hospital	Tawau Civil Hospital	Tenom Dispensary	Pensiangan Dispensary	Keningau Dispensary	Tambunan Dispensary	Ranau Dispensary	Sipitang Dispensary	Kota Belud Dispensary	Total
Ankylostoma duodenale ...	65	90	45	140	22	16	81	55	5	44	6	3	572
Ankylostoma duodenale and Strongyloides stercoralis ...	—	—	—	—	1	4	—	2	2	—	—	—	9
Ankylostoma duodenale and Ascaris lumbricoides ...	7	16	24	26	20	2	—	25	1	—	6	—	127
Ankylostoma duodenale and Tricocephalus dispar ...	5	22	12	5	—	3	—	8	4	—	9	1	69
Ankylostoma duodenale and Entamoeba histolytica ...	—	1	—	—	—	1	—	2	—	—	—	—	4
Ankylostoma duodenale, Strongyloides stercoralis and Ascaris lumbricoides	—	—	—	1	—	—	—	—	—	—	—	—	1
Ankylostoma duodenale, Ascaris lumbricoides and Tricocephalus dispar ...	6	1	4	—	4	—	—	1	—	—	2	—	18
Ankylostoma duodenale, Ascaris lumbricoides and Entamoeba histolytica ...	—	2	—	—	—	—	—	1	2	—	—	—	5
Strongyloides stercoralis ...	21	12	—	2	12	1	—	1	—	—	2	—	51
Strongyloides stercoralis and Ascaris lumbricoides ...	—	1	1	—	1	—	—	—	10	—	2	—	15
Strongyloides stercoralis and Tricocephalus dispar ...	—	1	2	1	—	—	—	3	—	—	7	—	14
Strongyloides stercoralis and Entamoeba histolytica ...	—	—	—	—	—	—	—	1	—	—	—	—	1
Ascaris lumbricoides ...	175	215	110	140	56	16	18	30	117	—	34	42	953
Ascaris lumbricoides and Tricocephalus dispar ...	9	48	22	9	7	6	—	10	27	19	51	1	212
Ascaris lumbricoides and Oxyuris vermicularis ...	—	1	—	—	—	—	—	—	—	—	—	—	1
Ascaris lumbricoides and Entamoeba histolytica ...	—	3	—	—	—	2	—	5	42	—	—	—	52
Ascaris lumbricoides, Tricocephalus dispar and Entamoeba histolytica ...	—	—	1	—	—	—	—	—	—	—	—	—	1
Tricocephalus dispar ...	89	134	13	21	2	10	—	4	15	—	28	4	320
Tricocephalus dispar and Amoebæ coli ...	—	1	—	—	—	—	—	—	—	—	—	—	1
Tricocephalus dispar and Entamoeba histolytica ...	—	—	1	—	—	—	—	—	—	—	—	—	1
Entamoeba histolytica ...	44	158	30	65	51	20	16	94	100	—	12	12	602
Clonorchis sinensis ...	4	—	1	—	—	—	—	—	—	—	—	—	5
Oxyuris vermicularis ...	—	1	—	—	—	—	—	—	—	—	—	—	1
Tænia Solim ...	—	1	—	—	1	—	—	—	—	—	—	—	2
Negative ...	752	918	315	637	388	90	42	79	96	—	52	98	3,467
Total	1,177	1,626	581	1,047	565	171	157	321	421	63	211	104	6,504

37. Of the 6,504 specimens of faeces examined, 25 specimens contained three different varieties of parasites, 506 specimens contained two varieties, 2,506 specimens contained a single variety and 3,467 were found to be negative.

38. The following summary shows the infection rate of the three most prevalent intestinal parasites:—

Institution	Ankylostoma duodenale per cent.	Ascaris lumbricoides per cent.	Tricocephalus dispar per cent.
Sandakan Civil Hospital	7.1	16.7	9.3
Jesselton Civil Hospital	8.1	17.7	12.7
Beaufort Civil Hospital	14.6	27.9	9.5
Kudat Civil Hospital	16.4	16.8	3.4
Tawau Civil Hospital	8.3	15.6	2.3
Tenom Dispensary	15.2	15.2	11.1
Pensiangan Dispensary	51.6	11.5	—
Keningau Dispensary	29.3	22.4	8.1
Tambunan Dispensary	3.3	47.3	10.9
Ranau Dispensary	69.8	30.2	30.2
Sipitang Dispensary	10.9	45.0	46.0
Kota Belud Dispensary	2.4	28.0	5.5

39.

MISCELLANEOUS EXAMINATIONS

	Sandakan Civil Hospital.	Jesselton Civil Hospital.	Beaufort Civil Hospital.	Kudat Civil Hospital.	Tawau Civil Hospital.	Tenom Dispensary.	Pensiangan Dispensary.	Keningau Dispensary.	Tambunan Dispensary.	Ranau Dispensary.	Sipitang Dispensary.	Kota Belud Dispensary.
GONORRHOEA —												
Urethral smears												
Positive	...	38	34	5	1	7	—	11	2	2	—	—
Negative	...	7	14	4	3	2	31	5	1	3	—	—
Vaginal smears												
Positive	...	84	—	—	—	—	—	2	3	1	—	1
Negative	...	111	—	—	—	—	—	—	—	1	—	—
LEPROSY —												
Nasal smears												
Positive	...	18	2	—	—	2	—	—	—	—	—	—
Negative	...	42	6	—	—	—	—	—	—	—	—	—
Smears from nodules												
Positive	...	1	—	—	—	—	—	—	—	—	—	—
Negative	...	18	—	—	2	1	—	1	—	—	—	—
TUBERCULOSIS — (SPUTUM)												
Positive	...	37	14	14	13	17	5	—	3	3	—	4
Negative	...	103	234	93	51	16	30	2	9	4	—	2
DIPHTHERIA — (THROAT SWABS)												
Positive	...	—	1	—	—	—	—	—	—	—	—	—
Negative	...	—	3	—	—	—	—	—	—	—	—	—

Twelve samples of distilled liquor were examined. In four of the samples examined the weight of alcohol *per cent.* was found to vary from 20.34% to 58.93%, and in seven the weight of alcohol was found to be less than two *per cent.*

IX.—SANDAKAN MENTAL HOSPITAL

40. The number of patients remaining under treatment at the end of the year, 1938, was 109, compared with a similar number at the end of 1937.

41.

	Males	Females	Total
Remaining on 1st January, 1938	85	24	109
Admitted during the year	23	9	32
Discharged during the year	7	—	7
Died	22	3	25
Remaining on 31st December, 1938	79	30	109
Percentage of recoveries	21.9 %
Percentage of deaths on total treated	17.7 %

42. *Admissions*.—There were 32 admissions during the year compared with 30 admissions in 1937. Of the 32 admissions, five were from Jesselton and Papar, four from Tawau, two from the Lahad Datu, Langkon, Menggatal, Tuaran and Tenom districts and one from the Sandakan, Kinabatangan, Kudat, Inanam, Penampang, Keningau, Ranau and Pundu Tuhan districts. Twenty-three cases were suffering from Mania, three from Melancholia, two from Dementia Praecox and Delusional Insanity and one from Dementia and Epileptic Insanity respectively.

43. *Discharges*.—Seven patients were discharged as cured during the year compared with a similar number in 1937.

44. *Deaths*.—Twenty-five deaths occurred in the Mental Hospital during the year compared with sixteen deaths in 1937. Mania and exhaustion caused five deaths, Dysentery and exhaustion three deaths, Nephritis and Dementia two deaths, Melancholia and exhaustion two deaths and the following diseases each caused one death, Acute Nephritis; Dysentery and Mania; Dysentery and Dementia; Asthma, Heart Failure and Mania; Exhaustion and Dementia Praecox; Nephritis, Exhaustion and Delusional Insanity; Senility, Dementia and Exhaustion; Amoebic Dysentery and Exhaustion; Amoebic Dysentery; Heart Failure, Dysentery and Mania; Melancholia and Dysentery; Dysentery, Heart Failure and Dementia; and Nephritis and Paranoia.

45. *Injuries*.—Several cases of minor injury occurred during the year as a result of quarrels among the patients.

46. *Occupation*.—Patients capable of working were employed in metalling the road between the Mental Hospital and the Main Barracks; also in pumping and carrying water, cleaning and scavenging, gardening and cooking.

47. *Board of Visitors*.—Eleven meetings were held by the Board of Visitors during the course of the year at the Mental Hospital.

X.—LEPER SETTLEMENT

48. On the first January, 1938, 69 patients suffering from Leprosy remained under treatment in the Settlement; during the year there were 8 admissions, compared with 9 in 1937; two patients were discharged from the Settlement, 5 died and 70 patients remained under treatment on 31st December, 1938.

49. *Admissions*.—Five of the eight admissions were Chinese, two from Lahad Datu, and one each from Tawau, Kudat and Papar. The remaining three admissions were one Malay from Tuaran, one Dusun from Jesselton and one Dusun from Menggatal.

50. *Discharges*.—Two female Chinese were discharged in November, 1938.

51. *Abscondings*.—No abscondings from the Settlement occurred during the year.

52. *Deaths*.—Five deaths occurred in the Settlement during the year, three from leprous cachexia, one from nephritis and one from pulmonary tuberculosis.

53. *Nationality and sex of patients under treatment in the Settlement.*

		Remained 1. 1. 38	Admitted	Discharged	Absconded	Died	Remained 31. 12. 38
Natives of the State							
Male	...	18	2	—	—	1	19
Female	...	1	—	—	—	—	1
Chinese							
Male	...	42	3	—	—	2	43
Female	...	5	2	2	—	—	5
Malays and Javanese							
Male	...	1	1	—	—	1	1
Female	...	2	—	—	—	1	1
		<hr/> 69	<hr/> 8	<hr/> 2	<hr/> —	<hr/> 5	<hr/> 70

54. Summary of patients under treatment during the past five years.

Year	Remained 1st January	Admitted	Discharged	Absconded	Died	Remained 31st December
1938	69	8	2	—	5	70
1937	69	9	—	4	5	69
1936	70	8	1	2	6	69
1935	66	16	—	4	8	70
1934	64	12	—	5	5	66

55. Treatment was administered by intramuscular injection of pure hydnocarpus oil with creasote, 4 c.c. of the latter to 10 c.c. of hydnocarpus oil. The injections were given weekly and the amount injected gradually increased from 2 c.c. to 20 c.c., 50 patients were treated regularly and 2,267 injections were given during the course of the year.

XI.—VENEREAL CLINIC, SANDAKAN

56. The Venereal Clinic opened in Sandakan in 1927, continued to do useful work. 94 new cases applied for treatment compared with 92 in 1937, the total number of attendances was 349 as compared with 352 in 1937. In addition 69 Chinese prostitutes attended the Clinic and received 679 treatments.

57. The following cases applied for treatment during the year:—

		New cases	Repetitions	Total
Primary syphilis	...	36	110	146
Secondary syphilis	...	9	31	40
Tertiary syphilis	...	10	25	35
Gonorrhoea	...	29	70	99
Gonorrhoea rheumatism	...	9	17	26
Orchitis	...	—	2	2
Bubo	...	1	—	1
Total	...	94	255	349

58. Nationality and sex of cases treated.

		New cases	Repetitions	Total
Chinese				
Male	...	76	202	278
Female	...	5	13	18
Natives of the State				
Male	...	4	7	11
Female	...	1	1	2
Malays and Javanese				
Male	...	5	16	21
Female	...	—	—	—
Other races				
Male	...	3	16	19
Female	...	—	—	—
Total	...	94	255	349

59.	Number of intravenous injections of Novarsenobillon administered	292
	„ „ intra-muscular injections of Gono-yatren administered	22
	„ „ prescriptions dispensed	37

XII.—VACCINATION AGAINST SMALLPOX

60. During the year 68,325 vaccinations against smallpox were performed compared with 14,833 vaccinations during the year 1937. Successful results were recorded in 86% of those examined.

61. Three Government Vaccinators were employed during the year, Abdullah in the Jesselton and Tuaran districts, Mohamed Daud bin Yakob in the Sipitang district until April when he was transferred to the Kinabatangan district, and Motusop bin Gungau in the Kinabatangan district throughout the year.

Vaccinations recorded in other districts were performed by members of the staff attached to Government Civil Hospitals and Dispensaries, also in the case of employees and dependents on Estates by Estate Medical Officers.

62. The following summary shows the number of vaccinations performed in each district during the year 1938:—

			RESULT				
			Total Vaccinated	Perfect	Modified	Failed	Not seen
EAST COAST	RESIDENCY						
District:	Tawau	...	3,972	389	64	476	3,043
	Semporna	...	1,109	206	28	19	856
	Lahad Datu	...	1,236	29	—	2	1,205
	Kinabatangan	...	6,225	1,265	144	102	4,714
	Sandakan	...	13,742	—	—	—	13,742
	Labuk and Sugut		3,056	—	—	—	3,056
	Kudat	...	2,224	899	99	143	1083
WEST COAST	RESIDENCY						
District:	Tuaran	...	9,717	3,920	340	1,062	4,395
	Kota Belud	...	1,891	510	12	71	1,298
	Jesselton	...	3,341	577	5	18	2,741
	Papar	...	385	343	—	42	—
	Membakut	...	903	640	—	18	245
	Beaufort	...	6,699	1,400	1	35	5,263
	Mempakul	...	2,832	559	32	34	2,207
	Sipitang	...	1,651	82	32	34	1,503
	Tenom	...	2,574	1,457	2	9	1,106
	Pensiangan	...	698	252	32	19	395
	Keningau	...	2,627	—	—	—	2,627
	Tambunan	...	2,134	1,302	112	260	460
	Ranau	...	749	364	117	99	169
	Bundu Tuhan	...	560	150	26	56	328
Total			68,325	14,344	1,046	2,499	50,436

XIII.—PROVISION OF MIDWIVES

63. During the year a scheme for training native midwives was drawn up and approved. Under this scheme it is proposed to train native women as midwives who, on completion of their training, will return to their villages and carry on the work in which they have been trained. A hostel to accommodate 8 pupil midwives together with a house for a Health Visitor is now under construction at Jesselton and a Maternity and Infant Welfare Centre at Penampang.

64. In the mean time two additional village midwives completed their training at Sandakan Civil Hospital and at the end of the year the services of a Government Village Midwife were available in each of the following districts:—

Tuaran	Membakut
Jesselton	Beaufort.
Papar	

65. At the end of the year 1938 twenty-two women were registered as certified midwives under the Midwives Ordinance, 1931. These midwives were distributed as follows:—

EAST COAST RESIDENCY:

Sandakan	—	2 in Government Service 2 attached to Dr. V. A. Stookes' Clinic 7 in private practice
Tawau	—	1 in Estate employ
Lahad Datu	—	1 attached to Dr. V. A. Stookes' Clinic
Kudat	—	1 in private practice.

WEST COAST RESIDENCY:

Tuaran	—	1 in Government Service
Jesselton	—	2 in Government Service 1 in private practice
Papar	—	1 in Government Service
Membakut	—	1 in Government Service
Beaufort	—	1 in Government Service
Tambunan	—	1 attached to Catholic Mission.

XIV.—SCHOOL HYGIENE

66. There are 19 Government Vernacular Schools for boys with a total enrolment of 1,356 children. The sanitary and health supervision of the schools in Sandakan and Jesselton is carried out by the District Surgeon and in other Stations by the Dresser in charge of the Government Dispensary. Stool examinations for worm infestation are carried out twice during the year and treatment administered when necessary.

Throughout the year under review an effort was made to encourage the children to drink milk at school, in Sandakan thirty children received daily a free issue of seven ounces of milk and in out-stations efforts are being made to collect herds of cattle for the purpose of obtaining milk for those children who are undernourished.

67. Dental Treatment was also provided for children in eight of the schools and the following table gives the summary of treatment given :—

		No. of Children examined	No. of Children with dental caries treated	Percentage
Sandakan	...	120	64	53.3
Tuaran	...	72	32	44.4
Jesselton	...	99	53	53.3
Kinarut	...	40	13	32.5
Papar	...	173	60	34.7
Bangawan	...	81	24	29.6
Keningau	...	74	19	25.6
Bingkor	...	120	40	33.3

These children had had in the past no dental treatment whatsoever and it is interesting to note that the incidence of dental caries is considerably higher in the towns of Sandakan and Jesselton as compared with the incidence in rural areas.

68. The following tables show the average weight and height of Vernacular School boys in age groups from 6 to 16 years :—

AVERAGE WEIGHT IN POUNDS					
Age Group	Sandakan	Jesselton	Keningau	Bingkor	Tambunan
6	34.8	40.0	—	40.0	41.0
7	43.0	46.7	—	41.0	47.0
8	44.5	53.7	45.6	47.0	49.0
9	50.6	59.0	47.8	48.7	51.0
10	53.8	73.4	58.3	51.6	57.0
11	59.4	84.2	63.5	54.8	59.5
12	63.8	76.0	68.3	64.2	73.5
13	73.8	78.0	84.0	75.4	55.0
14	82.9	87.8	88.7	81.6	79.8
15	99.3	110.2	98.4	92.4	85.6
16	105.0	124.0	106.5	97.4	110.5

Weights were recorded to the nearest pound and the boys were weighed without shoes and wearing only shorts.

AVERAGE HEIGHT IN INCHES					
Age Group	Sandakan	Jesselton	Keningau	Bingkor	Tambunan
6	42.2	44.0	—	45.1	44.0
7	44.4	47.6	—	43.9	48.2
8	47.6	50.6	46.7	47.1	46.9
9	49.4	52.1	48.3	48.3	47.5
10	50.2	56.5	51.1	49.0	50.4
11	51.8	57.9	53.7	50.3	51.8
12	53.8	57.1	55.7	52.8	55.5
13	56.3	59.9	57.9	57.0	51.2
14	58.5	61.0	59.9	58.3	59.1
15	61.0	64.0	61.5	59.6	56.5
16	62.5	65.0	62.0	61.4	63.1

Heights were taken to the nearest quarter inch without shoes.

69. The following tables show the combined average weights and heights for Vernacular Schools in age groups compared with Malay school Boys in Singapore, Negri Sembilan, Kedah and Penang.

AVERAGE WEIGHT IN POUNDS

Age Group	North Borneo	Singapore	N. Sembilan	Kedah	Penang
6	38.9	39	39.0	34.0	—
7	44.4	43	41.9	39.1	—
8	48.0	46	45.3	41.2	—
9	51.4	51	49.2	46.1	—
10	58.8	56	52.8	49.8	59.5
11	64.3	63	57.8	55.4	65.4
12	69.2	71	63.8	56.9	71.2
13	73.2	80	68.3	60.2	81.0

AVERAGE HEIGHT IN INCHES

Age Group	North Borneo	Singapore	N. Sembilan	Kedah	Penang
6	43.8	44	43.7	41.4	—
7	46.0	46	44.9	43.5	—
8	47.7	48	46.5	45.0	—
9	49.1	49	48.1	46.6	—
10	51.4	51	49.5	48.8	51.5
11	53.1	53	51.4	50.7	53.4
12	55.0	55	53.2	51.0	55.3
13	56.5	58	54.6	52.4	57.9

XV.—PUBLIC HEALTH — SANITATION

70. *Malaria Research*.—A scheme for the provision of a malaria research unit at Tambunan was drawn up and by the end of the year a Malaria Research Officer had been appointed and was on his way out to North Borneo. The buildings for the unit were under construction and should be ready for occupation by the end of May, 1939. The expenses of the scheme will be met from a grant from the Colonial Development Fund spread over three years.

71. *Antimalarial Measures*.—The antimalarial measures initiated in Sandakan in 1929 were continued during the year under review. The area under control consists of streams and water courses in seven ravines in the Sanitary Board area and earth drains, seepage areas and other potential breeding places in the North Road, Ernestina Road, Beatrice Road, Hospital Road, Darby Road, Humphreys Street, Guillemard Road, Church Road, Labuk Road, Jalan Anam, and Leila Road, the grounds of the Wireless Station, Main Barracks, Prison and the vicinity of the Mental Hospital.

72. Two labourers were employed, but this number was increased to three during the second half of the year. Oil spraying was carried out by means of a pneumatic knapsack sprayer and 2,176 gallons of anti-malarial mixture were used.

73. In Jesselton, the area under control consists of streams, ditches, potential breeding places in road side drains, seepages and swamps in the vicinity of Victoria Barracks, Victoria Valley, North side of Civil Hospital, Railway Clerks' Quarters, Railway Hotel, Jesselton Ice and Power Station, Atkinson Road and South Road.

74. *Labour*.—Two labourers were employed on this work under the supervision of an overseer. Oiling was carried out by means of the brushing method. 1,117 gallons of oil were used during the year.

75. Anti-malarial work in the vicinity of the Government Stations at Tenom and Keningau was also continued during the year by means of prison labour, 165.5 gallons of oil were used at the two stations.

76. At Tawau, the area under control consists of an area of swampy land at the back of the township, drains in the vicinity of the District Officer's house and the road side drains in Durahman Road.

One labourer, working under the supervision of the senior dresser at the Civil Hospital, carried out this work and 423 gallons of oil were used.

77. *Control of Food.*—The premises of 92 applicants for licences under the Sanitary Boards Ordinance for laundries, common lodging houses, dairies, bakeries, workshops and eating houses were inspected by the Health Officer in Sandakan and recommendations made as found necessary.

XVI.—PORT HEALTH WORK AND QUARANTINE

78. Sandakan is the principal port of the State. Other ports are Jesselton, Kudat, Lahad Datu, Semporna and Tawau. A Quarantine Station is maintained on the island of Berhala, about three miles from Sandakan.

79. At Sandakan, 36 vessels from Hong Kong, three from Saigon, one from Shanghai, one from Yokohama, one from Bangkok, one from Port Holland, one from Davao and one from Singapore, a total of 45 vessels were boarded on arrival by the Port Health Officer; 5,053 passengers and 3,465 crew or 8,518 persons in all were examined.

80. At Jesselton, eight vessels were boarded by the Port Health Officer, 813 crew and 500 passengers were examined.

81. At Tawau, one vessel from Macassar and one from Sandakan were boarded by the Port Health Officer, 100 crew and 90 passengers were examined, a total of 190 persons.

82. On the 18th January the port of Hong Kong was declared to be infected with smallpox and from that date to 24th June, when the Notification was cancelled, 2,597 deck passengers were transferred from ten vessels on arrival at Sandakan to the Quarantine Station for observation; 136 cabin passengers and 343 deck passengers were permitted to land under surveillance.

83. *Infectious Diseases discovered in ships.*—Two ships arrived in Sandakan infected with smallpox. One case of smallpox from a third vessel was also detected among a number of cabin passengers, while under surveillance.

84. *Rat Control.*—1,325 rats were trap in the port of Sandakan during the year, of these 418 were bacteriologically examined but none found infected with plague.

85. *Fumigation of Ships.*—One vessel was fumigated twice during the year by burning sulphur in open pans, 140 rats were destroyed.

LEAGUE OF NATIONS HEALTH ORGANISATIONS, EASTERN BUREAU

86. The weekly bulletin of epidemiological information, issued by the Eastern Bureau in Singapore, and broadcast from Malabar (Java) every Saturday morning was received regularly throughout the year. A summary of the bulletin was broadcast *en clair* each Sunday morning from the Sandakan Wireless Station at 0100 hour G.M.T.

XVII.—DANGEROUS INFECTIOUS DISEASE

87. No cases of cholera, plague, smallpox or cerebro-spinal meningitis were reported in the State during the year apart from the three cases of smallpox imported from Hong Kong.

XVIII.—ESTATES AND COMMERCIAL COMPANIES

88. The health of the labour force employed on the various Rubber and Tobacco Estates and Logging Camps was good throughout the year. The labour force employed decreased from 18,480 on 1st January to 15,592 on 31st December. The average sick rate for the year for in-patients was 1.3% compared with 1.4% in 1937, and the death rate *per mille* was 19.8 compared with 18.0 *per mille* the previous year.

89. The following table shows the average estate labour force, the number of deaths and the death rate during the past five years :—

Year	Average labour force	No. of deaths	Death rate per mille
1938	17,043	337	19.8
1937	17,199	309	18.0
1936	11,142	124	11.1
1935	11,083	162	14.7
1934	10,430	150	14.4

PREVAILING DISEASES AMONG ESTATE LABOURERS

90. *Malaria*.—2,972 cases of Malaria were admitted to hospital during the year compared with 3,631 in 1937 and 1,734 in 1936. The morbidity rate was 17.4% compared with 21.1% in 1937. There were 70 deaths from this disease during the year compared with 103 deaths the previous year.

91. *Beri-beri*.—312 cases of beri-beri were admitted to hospital during the year with 14 deaths compared with 224 cases and 7 deaths in 1937. The morbidity rate was 1.8% compared with 1.3% in 1937.

92. *Pneumonia*.—303 cases of pneumonia were admitted to hospital during the year with 103 deaths, compared with 262 cases and 72 deaths during 1937. The morbidity rate was 1.8% compared with 1.5% in 1937.

93. *Dysentery*.—182 cases of dysentery were admitted to hospital during the year with 9 deaths, compared with 216 cases and 20 deaths during 1937. The morbidity rate was 1.1% compared with 1.3% in 1937.

94. *Ankylostomiasis*.—The mass treatment of labourers for this disease was carried out twice during the year on many of the estates and 6,254 labourers were treated.

XIX.—EXAMINATIONS FOR HOSPITAL DRESSERS

95. Two examinations for Hospital Dressers for promotion were held during the year in Sandakan, Jesselton and Tenom in June and December.

96. Three Dressers employed by Government and four dressers in private employ entered for the examination in June, of these three qualified for promotion to Grade III.

97. Seven Dressers employed by Government and five Dressers in private employ entered for the examination in December, of these four qualified for promotion to Grade II and one to Grade III.

XX.—STAFF CHANGES

98. Dr. J. P. Taylor acted as Principal Medical Officer until the return from leave of Dr. P. A. Dingle, C.B.E., who resumed duty as Principal Medical Officer with effect from 22nd April, 1938.

99. Dr. Taylor was transferred to Jesselton and held the appointment of District Surgeon with effect from 1st June, 1938.

100. Dr. J. Kennedy O'Byrne, District Surgeon, Jesselton, proceeded on furlough on the 2nd June, 1938.

101. Dr. J. C. T. Tregarthen carried out the duties of District Surgeon, Beaufort and Interior until 17th November, 1938, when he proceeded on furlough.

102. Dr. G. Stonehill vacated his appointment as District Surgeon, Kudat, on 21st June on retirement from the service.

103. Dr. H. Wands held the appointment of District Surgeon, Sandakan, throughout the year.

104. Dr. Marcus Carlyle Clarke M.B., B.S., (Sydney), reported his arrival on 21st July, 1938, and was appointed District Surgeon, Kudat, with effect from 26th July, 1938.

105. Miss E. Ashworth returned from furlough on 10th December and resumed duty as Nurse-Matron, Civil Hospital, Sandakan.

106. Miss D. Thrift acted as Nurse-Matron, Civil Hospital, Sandakan, up to December 13th and vacated her appointment on the return from furlough of Miss E. Ashworth.

107. Miss H. E. Bates carried the duties of Nursing Sister, Civil Hospital, Jesselton, throughout the year.

XXI.—FINANCIAL

108. *Revenue*.—The total revenue of the Medical Department for the year 1938 amounted to \$19,112.71, compared with \$18,960.45 in 1937, an increase of \$152.26.

109. *Expenditure*.—The total expenditure of the Medical Department for the year 1938 amounted to \$233,459.94, compared with \$197,917.54 in 1937, an increase of \$35,542.40.

XXII.—METEOROLOGY OF NORTH BORNEO

110. The equiptment at Sandakan includes the following instruments :—

- Mercury barometer.
- Stevenson screen with wet and dry bulb Hygrometer and maximum and minimum thermometers.
- Five-inch rain-gauge, "Snowdon" Pattern.
- Dines pressure tube anemometer recording speed.

The equipment at auxiliary stations at Tawau, Semporna, Kudat, Jesselton, Beaufort, Tenom, Keningau and Tambunan consists of wet and dry bulb Hygrometer, and maximum and minimum thermometers together with a standard rain-gauge of five inches diameter. In addition standard rain-gauges of five inches diameter are provided at eighteen other Stations.

TEMPERATURE

111. The mean temperature for the year was 80.6° Fahrenheit and the mean daily range was 15.7 degrees. The recorded extremes were maximum 96° at Beaufort, in the West Coast Residency and minimum 58° at Tambunan (1,800 feet above sea level) also in the West Coast Residency.

RAINFALL

112. The mean rainfall for the year, of observations recorded at twenty-seven stations, was 118.3 inches, compared with 111.2 inches in 1937.

Mean Rainfall during the last six years :—

Year	Rainfall in inches	Year	Rainfall in inches
1938	118.3	1935	102.1
1937	111.2	1934	128.4
1936	100.1	1933	106.9

113. The mean rainfall during the year in each Residency was as follows : —

	Rainfall in inches	Difference from normal'
West Coast Residency (18 Stations)	121.4	+ 14.4 inches
East Coast Residency (9 Stations)	112.0	+ 14.7 inches

TELEGRAPHIC REPORTS OF WEATHER INFORMATION

114. Observations of barometric pressure, temperature, humidity, wind direction and force, visibility, weather and state of the sea were recorded daily at Sandakan at 6 a.m., 9 a.m., 2 p.m. and 8 p.m. and returns incorporating these observations were forwarded at the end of each month to the Director of the Meteorological Office of the Air Ministry in London. Observations taken at 6 a.m. and 2 p.m. were forwarded daily by wireless telegraphy to the Royal Observatory, Hong Kong and the Superintendent Malayan Meteorological Service, Singapore.

115. Summary of Meteorological Observations taken at fixed hours at Sandakan.

LATITUDE 5° 50' N, LONGITUDE 118° 07' E.

Hours of observation. { 06h. 00m.
 { 09h. 00m.
 { 14h. 00m.
 { 20h. 00m.

Month	PRESSURE Mean of Day at M.S.L. mb.	TEMPERATURE							PRECIPITATION					Days
		ABSOLUTE		MEAN VALUE			Diff. from Normal ° F	Wet Bulb ° F	Relative Humidity %	Mean Cloud Amount 0—10	Amount inches	Difference from normal inches		
		Max. ° F	Min. ° F	Max. ° F	Min. ° F	½ and Min.								
January	1009.9	87	72	84.2	75.1	79.7	—0.1	76.3	87	8.3	22.07	+ 2.67	20	
February	1010.4	87	71	84.6	74.1	79.3	—0.9	76.1	87	8.5	24.02	+ 13.05	13	
March	1009.0	89	73	86.1	75.4	80.7	—0.3	76.9	86	7.4	9.24	+ 0.77	16	
April	1008.1	90	73	87.3	76.0	81.7	—0.5	77.7	85	8.4	9.26	+ 4.77	17	
May	1008.0	90	73	86.9	75.9	81.4	—1.1	77.7	86	7.5	9.46	+ 3.13	14	
June	1008.8	89	71	86.5	75.0	80.7	—1.0	76.7	85	7.9	11.05	+ 3.55	16	
July	1008.6	89	72	86.9	74.8	80.9	—0.9	76.3	85	7.7	10.63	+ 3.91	16	
August	1008.6	91	74	88.3	75.7	82.0	+0.2	77.3	83	6.8	5.73	— 2.16	12	
September	1008.4	91	73	88.0	75.4	81.7	—	76.8	83	7.8	17.71	+ 8.38	19	
October	1009.2	90	72	87.3	74.8	81.0	—0.4	76.5	83	8.2	11.41	+ 1.08	18	
November	1008.0	89	72	85.7	74.5	80.1	—0.8	76.5	87	8.8	22.78	+ 8.06	24	
December	1008.1	87	72	84.7	74.6	79.7	—0.5	76.1	87	8.9	19.96	+ 1.32	26	
For year	1008.8	91	71	86.4	75.1	80.7	—0.6	76.7	85	8.0	173.32	+ 48.53	211	

